

FORM PTO-1190
(REV 10-96)

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

AP 8563

08/973618

U.S. APPLICATION NO. (If known, see 37 CFR 1.5)

INTERNATIONAL APPLICATION NO.

PCT/EP96/02660

INTERNATIONAL FILING DATE

6/19/96

PRIORITY DATE CLAIMED

6/29/95

TITLE OF INVENTION

CASING FOR A DRIVE UNIT

APPLICANT(S) FOR DO/EO/US

WALTHER, et al

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

- 1 ☒ This is a **FIRST** submissions of items concerning a filing under 35 U.S.C. 371.
- 2 ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
- 3 ☒ This express request to begin national examination procedures (35 U.S.C. 371 (f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371 (b) and PCT Articles 22 and 39(1).
- 4 ☐ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
- 5 ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(3))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
- 6 ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2))
- 7 ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
- 8 ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371 (c)(3)).
- 9 ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
- 10 ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 16. below concern documents(s) or information included:

- 11 ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
- 12 ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
- 13 ☒ A **FIRST** preliminary amendment.
☐ A **SECOND OR SUBSEQUENT** preliminary amendment.
- 14 ☐ A substitute specification.
- 15 ☐ A change of power of attorney and/or address letter.
- 16 ☐ Other items or information.

U.S. APPLICATION NO.		INTERNATIONAL APPLICATION NO. PCT/EP96/02660		ATTORNEY'S DOCKET NUMBER AP 8563	
17 <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)): Search Report has been prepared by the EPO or JPO \$930.00 International preliminary examination fee paid to USPTO (37 CFR 1.482) No international preliminary examination fee paid to USPTO (37 CFR 1.482) but international search fee paid to USPTO (37 CFR 1.455(a)(2)) Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(2)-(4)				CALCULATIONS	PTO USE ONLY
ENTER APPROPRIATE BASIC FEE AMOUNT =				\$	930
Surcharge of \$130.00 for furnishing the oath or declaration later than months from the earliest claimed priority date (37 CFR 1.492(e)). <input type="checkbox"/> 20 <input type="checkbox"/> 30				\$	
CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE		
Total Claims	10 -20 =		x \$22.00	\$	
Independent claims	2 -3 =		x \$82.00	\$	
TOTAL OF ABOVE CALCULATIONS =				\$	930
Reduction of 1/2 for filing by small entity if applicable. Verified Small Entity Statement must also be filed (note 37 CFR 1.9, 1.27, 1.28).				\$	
SUBTOTAL =				\$	930
Processing fee of \$130.00 for furnishing the English translation later than months from the earliest claimed priority date (37 CFR 1.492(f)). <input type="checkbox"/> 20 <input type="checkbox"/> 30				\$	
TOTAL NATIONAL FEE =				\$	930
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accomplished by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property				+	\$
TOTAL FEES ENCLOSED =				\$	930
				Amount to be:	
				refunded	
				charged	

a. ☐ A check in the amount of \$ _____ to cover the above fees is enclosed.

b. ☒ Please charge my Deposit Account No. 09-0950 in the amount of \$ 930 to cover the above fees.
A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any
overpayment to Deposit Account No. 09-0950. A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO

J. Gordon Lewis, Esq.
Legal Department
ITT Automotive, Inc.
3000 University Drive
Auburn Hills, MI 48326-2356

SIGNATURE

J. Gordon Lewis
NAME

28,735
REGISTRATION NUMBER

23 MAR 1998

Case No. AP8563

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application:

Walther, et al.

Serial No.: 08/973,658

Group Art Unit:

Filed: December 19, 1998

Examiner:

For: Casing For A Drive Unit

RESPONSE TO NOTIFICATION OF MISSING REQUIREMENTS UNDER 35.
U.S.C. 371 IN THE U.S. DESIGNATED/ELECTED OFFICE

Box Missing Parts
Assistant Commissioner of Patents
Washington, D.C. 20231

Dear Sir:

In response to the Notification of Missing Requirements Under 35 U.S.C 371, dated March 13, 1998, transmitted herewith for filing are the Declaration/Power of Attorney and Assignment documents relating to the above-identified U.S. Patent Application.

The Commissioner is authorized to charge our Deposit Account No. 09-0950 for any additional fees or credit the account for any overpayment.

Respectfully submitted,

ITT AUTOMOTIVE, INC.



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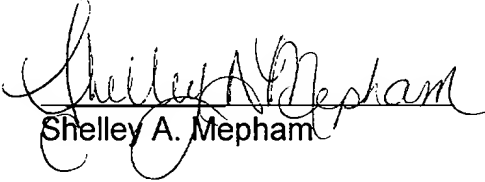
Date: 03/16/98

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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231, on 03/16/98.


Shelley A. Mephram

03/16/98 09:06:00

08/973658

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Walther et al.

Serial No.: To be assigned

Group Art Unit:

Filed: Herewith

Examiner:

For: CASING FOR A DRIVE UNIT

Attorney Docket No.: AP 8563

Assistant Commissioner of Patents

Washington, D.C. 20231

PRELIMINARY AMENDMENT

Dear Sir:

Please amend the application as follows prior to examination on the merits:

IN THE CLAIMS:

Please cancel claims 1-5 and add the following new claims:

6. (New) A casing for a drive unit, which consists of a base body with a depression for the accommodation of drive unit elements, wherein in addition to the depression, a recess is provided, the depression and the recess having open sides opposite to each other.
7. (New) A casing in accordance with claim 6, wherein penetrating apertures are provided between the depression and the recess.
8. (New) A casing in accordance with claim 6, wherein a plug casing is connected to the recess, in one piece with the base body.

9. (New) A casing in accordance with claim 6, wherein a flange surface is provided which is adapted for the attachment of an electrical motor and for accomodating brushes of the electrical motor in or on the flange surface, and where penetrating apertures which lead into the depression are provided in the flange surface.
10. (New) A casing in accordance with claim 9, wherein the casing is adapted to accomodate a drive unit and the electronic unit and is provided with a plug casing, whereby electrical conducting strips between the plug in the plug casing of the electronics unit, the electrical motor, and a switch being activated by the drive unit, are placable exclusively in the casing.
11. (New) A motor drive unit, with a electric motor and a casing which comprises a base body with a depression for the accommodation of drive unit elements, wherein, in addition to the depression, a recess is provided in the casing, the depression and the recess each having an open side opposite to each other, and wherein an electronic unit is arranged in the recess.
12. (New) A motor drive unit in accordance with claim 11, wherein penetrating apertures are provided between the depression and the recess.
13. (New) A motor drive unit in accordance with claim 11, wherein a plug casing is connected, in one piece with the base body, to the recess.
14. (New) A motor drive unit in accordance with claim 11, wherein a flange surface, to which an electrical motor can be attached, is provided, whereby the brushes of the electrical motor are provided in or on the flange surface, and that, penetrating apertures which lead into the depression are provided in the flange surface.

15. (New) A motor drive unit in accordance with claim 14, wherein the drive unit and the electronic unit are provided in a casing, wherein the electrical motor is flange-mounted to the casing and the casing is provided with a plug casing, whereby electrical connections between a plug in the plug casing of the electronics unit, the electrical motor, and a switch which is activated by the drive unit, are carried out by way of conducting strips which are placed exclusively in the casing.

REMARKS

Prior to a formal examination of the above-identified application, acceptance of the new claims is respectfully requested. The substitute claims do not add any new matter and are submitted to conform this case to the formal requirements of U.S. Patent Office practice.

Respectfully submitted,
ITT AUTOMOTIVE, INC.



By: _____

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08/973658

AP8563

CASING FOR A DRIVE UNIT

BACKGROUND OF THE INVENTION

The invention relates to a casing for a drive unit, which consists of a base body with at least one depression for the accommodation of drive unit elements. Such types of drive unit casing are used, in particular, in windshield wiper apparatuses, whereby the windshield wiper apparatus or its drive unit is controlled by way of an electronics unit.

It has already been proposed to connect the electronic control unit with the casing, in order to achieve a compact construction unit.

SUMMARY OF THE INVENTION

The previous proposals were not, however, able to satisfy in this respect. It is thus proposed that, in addition to a first recess -- that is to say, the depression for the accommodation of the drive unit elements -- a second recess should be provided in the base body, the open side of which lies opposite the open side of the first depression. Penetrating apertures, which connect both depressions with one another, are provided within the casing itself.

The electronic control device can now be inserted into the second recess, whereby a connection with the drive unit casing can be created by way of the penetrating apertures.

It is additionally proposed to construct a plug casing with the base body in a single part.

This makes it possible to provide contact pins on the electronic

control device, which are inserted into the plug casing upon the insertion of the electronic control device into the second depression.

The drive unit casing has a flange surface to which an electrical motor is joined. The flange for the attachment of the electrical motor has penetrating apertures, which proceed into the first recess. Electrical connections, which lead to the electronic control device, can be conducted through these penetrating apertures.

If such a type of drive unit is used for a windshield wiper apparatus, a parking position switch is generally provided, which is carried out in the following manner. Discontinuous contact strips, along which contact springs slide, are provided on a gear drive unit. It can be achieved, by means of a corresponding formation of the contact strips, that the motor is provided with current, even after the interruption of the main switch, for long enough until the windshield wipers which are being driven reach their parking position. The contact springs are generally constructed on a stamped grid which is placed on the base of the first recess. This contact grid is electrically connected, on the one hand, with the electronic unit in the second recess and, on the other hand, with the wires which lead to the electrical motor.

This apparatus has the advantage that all of the lines remain inside the casing, so that no lines run on the external side of the drive unit, so that the danger that short circuits will arise is minimized.

BRIEF DESCRIPTION OF THE DRAWINGS

The construction of a motor drive unit for the wiper apparatus of a motor vehicle is described in the following. As is evident

from the description, the essential elements of this apparatus can also be used for motor drive units which serve for other purposes of use.

The description is carried out in reference to 10 diagrams, which depict the following:

Figure 1 depicts a motor drive unit without a drive cover, whereby the depiction is carried out, in part, in a view from above and, in part, in a cross-section;

Figure 2 depicts a section along the line II - II of Figure 1;

Figure 3 depicts, in a view from above, the drive unit casing without cover unit, with a contact disk placed on the base of the casing;

Figure 4 depicts a section along the line IV - IV of Figure 3;

Figure 5 depicts a view from the outside against the base of the drive unit casing, partially in a view from above and partially cut away, with an electronics unit inserted;

Figure 6 depicts a view from above of the brush supporting plate of the electrical motor;

Figure 7 depicts a section through the casing along the line VII - VII of Figure 1;

Figure 8 depicts a detail of Figure 2;

Figure 9a, 9b depict the contact plate which is inserted into

the casing;

Figure 10 depicts one possibility for the attachment of the contact plate in the casing;

Figure 11 depicts individual details of the passage of water through the drive shaft.

DETAILED DESCRIPTION OF THE DRAWINGS

Reference will first be made to Figure 1.

The unit consists of an electrical motor 1 as well as a drive unit 2. The electrical motor 1 is attached laterally to the casing of the drive unit 3. The drive unit involves a so-called "pendulum drive unit".

This consists of the following elements: The motor shaft 4 is extended and supports, on its extended end, a helical unit 5. This meshes with a worm wheel 6. Eccentrically to the axis 7 of the worm wheel 6, a first lever 8 with a partial pinion 9 is connected with the worm wheel 6, in a swivelable manner, in the center of rotation 13. The partial pinion 9 engages with an additional partial pinion 9' on the drive shaft 11. One center of rotation 12 on the first lever 8 is linked to the drive shaft 11, by way of a second lever 10, in such a manner that the center of rotation 12 always moves on a partial radius around the axis of the drive shaft 11.

If the worm wheel 6 is driven by the motor during the maintenance of a given direction of rotation, the first lever 8 carries out, on the basis of its doubled articulation, a forced movement in the centers of rotation 12, 13, which leads to the drive shaft being moved back and forth. Nearly any angle of swiveling of the drive shaft 11 which is desired can be adjusted by means of a

corresponding choice of the geometry of the partial pinion 9, 10, as well as of the articulation points 12, 13.

As can be inferred, in particular, from Figure 2, the axis of the center of rotation 13 projects somewhat over the first lever 8. A cap 15, which slides along on the lower side of the cover unit 17 of the drive unit casing 3, is placed on this end.

A drive unit casing 3, which consists of two parts, is provided for the accommodation of this drive unit. The first part consists of a base body 20 of plastic, which has several recesses. The largest recess serves for the accommodation of the worm wheel 6, so that the base body 20 is essentially shaped as a pan or trough. The open side of the base body 20 is sealed by means of the cover unit 17 of metal, which has already been mentioned, and which forms the second part of the drive unit casing.

The base body 20 now accommodates, in addition to the drive unit elements, additional elements which serve for the control of the motor. These are, in particular, an electronic unit 23 (see Figure 5) and a contact plate 22 with contact lugs, which slide along the corresponding switching paths which are attached to the worm wheel 6.

In order for these elements to be accommodated, additional chambers or recesses, which will be described in further detail in the following by means of Figures 3, 4 and 5, are provided in the base body 20. A first area serves for the accommodation of the worm wheel 6, and will thus be designated in the following as the gear chamber 25. It is circular, and has a depth which essentially corresponds to the height of the gear. As is to be inferred from Figure 3, a contact plate 22 is inserted onto the base of the gear chamber in a laminar manner. A peg 26, which forms the axis of the worm wheel 6, is located in the center of

the chamber. This peg is held in a corresponding depression 28 in the base 27 of the gear chamber.

The base has additional depressions 28', 28", into which a screening throttle 29 or a capacitor 29' are inserted, which are positioned on the lower side of the contact plate 22. A groove 30, within which the helical unit 5 is positioned on the extended motor shaft 4, is joined to the gear chamber 25. For the passage of the shaft, a penetrating aperture, which ends in the flange for the electrical motor 1, is connected to the groove 30 in the axial direction. In order for the helical unit 5 and the worm wheel 6 to enter into contact, the groove 30 is open to the gear chamber 25. A swiveling area 31 which, as is clearly to be inferred from Figure 1, serves to create possibilities for swiveling for the first and second lever arm 8, 10, is located on an additional side of the gear chamber 25, displaced by about 90 degrees to the groove 30 and turned away by the flange of the electrical motor.

This area 31 is bounded on the outside in an approximately square manner, the base is flat, and its depth is significantly less than that of the gear chamber 25, so that a stage 32 is present between the gear chamber 25 and the swiveling area 31.

For the accommodation of a bearing sleeve 40, a pot-shaped mounting dome 41 is provided in connection with the swiveling area 31, as well as the gear chamber 25. The edge of the mounting dome 41 begins at approximately the height of the base of the swiveling area 31. The base 42 of the mounting dome 41 is distinctly below the base of the gear chamber 25. Because the external contour of the dome 41 projects, in part, into the gear chamber 25, the wall of the dome is cut away in this area. The bearing sleeve 40, which begins at the level of the base of the swiveling area 31, projects through the base 42 of the dome 41, and extends beyond the same, is located in the center of the

dome. Between the internal wall of the dome and the external wall of the bearing sleeve 40, reinforcement struts 45 extend over the entire height of the dome. The struts are partially cut away, specifically, in the area which extends into the gear chamber 25.

The stated areas: gear chamber 25, groove 30, swiveling area 31, as well as the dome 41 -- are encircled by an edge 50, the upper border of which proceeds at the same height and serves as a support surface 51 for the metal cover 17 and a sealing unit which is inserted, if necessary, between the edge and the cover unit.

As is to be inferred from Figures 4 and 5, the edge 50 has been guided, in part, up to a point below the base of the individual areas. It can be seen in Figure 5 that the lower edge area 52 encloses the lower side of the base 53 of the gear chamber 25 by approx. 180 degrees. From this lower edge area 52, which is extended over the lower side of the base, four rib units 54 proceed to a central socket 55, which likewise projects out from the lower said of the base 53 and serves, as is to be noted from Figure 2, for the accommodation of the peg 26.

It can be noted that the base socket 55 ends in approximately the same height as the base 42 of the dome 41. Three reinforcement struts proceed between the socket 55 and the dome 41: the central rib unit 56 proceeds from the center of the socket 55 to the axis of the dome 41, and two side rib units 57 proceed, each tangentially, into the socket 55 or into the dome 41.

This arrangement of the rib units was selected because it is necessary for the peg 26, and therefore the axis of rotation of the worm wheel 6 as well as the axis of the drive shaft 11, to remain aligned as precisely to one another as possible, in order to prevent noises during the operation of the motor. In order to

achieve the rigidity which is necessary for that purpose, the socket 55 was not connected directly to the bearing sleeve 40, but through the insertion of the dome 41, with a diameter which is expanded relative to the bearing sleeve 40. Possible deformations can be thereby be better absorbed by the rib units 56, 57. The bearing sleeve 40 itself is held in the dome unit 41 by means of the reinforcement struts 45.

The edge 50 is also drawn downwards into the area of the swiveling area 31, so that a reception chamber 60, which serves for the accommodation of an electronic control device, is formed on the side turned away from the swiveling area 31. This can be noted particularly well in Figure 5, in which a cover unit 61, which seals this chamber, is partially cut away, so that a plate 62 to which electronic switching elements are applied can be noted. The reception chamber 60 is bounded, on the one hand, by the edge which is drawn downwards, as well as by one of the rib units 54 and one lateral rib unit 57.

A plug casing 70 is integrally formed with the lateral wall of the swiveling area 31 or the reception chamber 60, which proceeds tangentially into the wall of the gear chamber 25. The plug casing involves a rectangular casing 71, which is open at the top and bottom. The casing 71 is divided into two areas by a separating wall 72, which proceeds in parallel to both of the open sides. The one area is open to the upper side of the casing and serves for the guidance of a plug unit, for which the internal side of the casing is provided with corresponding guide grooves 73. The other area of the casing, which is open to the lower side of the casing 3, is additionally open to the reception chamber 60, so that the plate 62 can project into this area of the casing. Four pins, which project through penetrating apertures 74 in the separating wall into the first area of the plug casing 70, and can be brought into connection there with the corresponding contacts of the counter-plug, are soldered to the

plate.

Three penetrating apertures 75, which penetrate into the reception area 60, are likewise provided in the area of the base of the gear chamber 25. Contact brackets 111, 117, 118 of the contact plate 22 project through these penetrating apertures 75.

One additional penetrating aperture 76 proceeds from the reception area 60, through the base of the swiveling area 31, into the swiveling area. The significance of this will be described in further detail below in connection with the explanation of the contact plate 22.

As is to be noted in Figures 1 to 4, three attachment elements 80, 81 and 82 are positioned on the external side of the casing.

These attachment elements can, in principle, be provided on every point of the casing, depending on how the installation situation in the vehicle requires this. The attachment elements 80, 81 and 82 each consist of a base socket with two side walls 83, 84 proceeding in parallel, which have the shape of a right-angled triangle. One cathetus of the triangle has a length which corresponds to the height of the casing 3 and connects with the casing 3. The other cathetus thereby extends perpendicularly from the wall of the casing. The side walls 83, 84 form a surface 85 between themselves which has an attachment eyelet 86 at the external end. The other part of the surface can, insofar as its rigidity allows this, be cut through. The attachment elements 80, 81, 82 can each be positioned in such a manner that the eye unit 86 either proceeds at the height of the casing cover 17, or at the height of the lower side of the casing 3, or centrally.

Reference will be made in the following to Figure 6. The area in which the electrical motor is flange-mounted has a depression 89 for the accommodation of a support for the motor shaft 4. In addition, depressions 90, 91, with which the attachment hooks, by

means of which the motor casing 92 is attached to the casing, engage, are provided above and below the flange area. A brush support plate 92a of plastic, which is provided with corresponding guide channels 93 for the brushes 94 of the electrical motor, can either be placed on the flange surface, or else be already constructed in advance from the outset as a single unit with the casing 3. A correspondingly-folded holding plate 95, which can be connected with the contact plate 22 on the base of the casing 3, is provided for the provision of power to the brushes 94 or for holding the brushes 94 in the corresponding guide channels 93 in the brush support plate 92. In addition, a penetrating aperture passes through the flange surface to the gear chamber 25. Blades units 96, which engage through this penetrating aperture and can be soldered to the contact plate, are provided on the holding plate 95. The holding plate additionally has a blade unit 96 which can be placed against the metallic casing mantle 97 of the electrical motor.

The elements noted above, which form the casing, are formed from a piece of plastic and produced by means of injection molding. In order to achieve the necessary rigidity, the plastic contains mineral fibers between 2 mm and 10 mm long. It contains, in addition, additives which make the plastic resistant against the influences of weathering (ozone) and confer sliding characteristics upon it, in order for the drive shaft to be supported directly in the guide casing.

Attention must be paid in the design of the base body 20 that an equal wall thickness is, to the greatest extent possible, present in all areas.

This has the result, first of all, that the areas in the base of the gear chamber 25 which accommodate the throttle and the capacitor appear as corresponding convexities on the lower side of the base 53.

Furthermore, the bearing sleeve 40, insofar as this projects outwardly out from the dome 41, is thickened. This corresponds to a facing sheath which is turned up which, in the previous casings, which were not produced from plastic, was inverted over the bearing sleeve which is visible on the outside of the vehicle. Through the fact that the entire casing is produced from plastic, a separate facing can be dispensed with. It should be noted that this generally presupposes that, as has already been explained, the plastic consists of weathering-resistant material.

The upper edge of the base body 20 is, as has already been explained, constructed in a flat manner, so that the cover unit 17 can be placed on there. Since, as is explained further below, the cover unit 17 also serves as a flexible support for the drive unit (cap unit 15), an increased demand is to be placed on the evenness of the surface of the upper boundary of the edge.

In order to achieve this, the injection mold must be refinished for long enough until, in regard to the slight deformations which arise during the cooling off of the casing after the removal out of the mold, a flat edge surface arises. Such a type of refinishing is extremely difficult. The following way is, therefore, proposed (see Figure 8).

The casing 3 is connected to several points with screws 101, the allotted screw holes 102 of which are positioned on the edge of the casing. Elevations 100, which enclose the screw hole over a graduated circle of the lateral surface of the casing 3, are located on the edge, next to the screw holes 102. The height of the elevation is slightly less than the height of the sealing unit 103 which is used between the casing 3 and the casing cover 17.

The individual elevations 100 can easily be brought to the same height since, after a first injection molding and after the cooling off of the casing, the individual elevations 100 are measured, and the casting mold is refinished in a corresponding manner so that the elevations are all at the same height in the casings which are produced subsequently. Since the measurements are carried out at defined points, specifically at the elevations 100, the finishing of the mold can be carried out more easily, since it must only take place anew at the corresponding points of the mold. This is simpler than if it were attempted to make the entire edge surface flat.

The sealing unit 103 itself is flexible, so that, if the cover is screwed onto the casing, the sealing unit 103 is pressed downwards far enough until the cover 17 is supported on the elevations 100.

The contact plate 22, which is depicted in Figures 9-a and 9-b, will be described in the following. The contact plate 22 is stamped out of a metal sheet, whereby support bars, which are cut through after the placing of the contact plate 22 into the casing 3, still remain between the individual conducting strips. The primary conducting strip 101 has a central penetrating aperture 102 which, as soon as the contact plate 22 is supported on the base of the gear chamber 25, projects through the peg 26 for the worm wheel 6. A contact spring 103, which is bent out of the plane of the contact plate and has an elevated contact 104 at its end, which cooperates with a corresponding conducting strip on the lower side of the worm wheel, corresponds to the primary strip. It has, in addition, a contact lug 105 which is located in the outer area of the contact plate 22.

One additional conducting strip 106 proceeds approximately parallel to the contact spring 103 and supports, on its end, a second contact lug 107 as well as, at its other end, a connecting

part 108 for the throttle 28. A third conducting strip 109, which proceeds on the external side of the contact plate in an AL@ shape, has, on its one end, an accommodation mount 110 for the other end of the throttle 28 and ends, on the other end, in a first contact pin 111.

This third conducting strip 109 has an additional connection 112 for the capacitor 29, the other end of which connects with a connection 113 on the primary conducting strip 101. A fourth conducting strip 115 is provided with a contact spring 116 which, just like the first contact spring 103, is provided, on its end which is bent upwardly, with a contact 117a which cooperates, in an additional conducting strip, with the lower side of the worm wheel 6. The other end of this conducting strip 116 likewise ends in a second contact pin 117b, which is positioned next to the first contact pin 111. A third contact point 118 is located on the primary conducting strip 101. The three contact points 111, 117, 118 are positioned next to one another.

The primary conducting strip 101 is connected, as a single part, with a cooling plate 120. This extends perpendicularly to the primary conducting strip 101 and is connected with the same by means of an "L"-shaped, upwardly-bent connecting part 121. The upper end of the cooling plate 120 is bent back and forms a contact surface 122 for the cover 17 of the casing. A bracket 123 is stamped out and bent outwardly in the surface of the cooling plate 120.

If the contact plate 22 is placed on the base of the gear chamber, then both contact lugs 105, 107 are located directly in front of the penetrating aperture in the flange for the electrical motor. The brush support plate 95 has two bent-back blades which extend through this penetrating aperture and contact the contact lugs 105 and 107. The contact pins 111, 117, 118 project through the penetrating aperture 75 in the base of the

gear chamber 25 and extend into the area of the electronics mount 60. The corresponding pins are thus also noted in Figure 5.

The cooling plate 120 projects through the penetrating aperture 76 in the base of the swiveling area 31, so that the lower end can come in contact with the units of the electronic unit which are to be cooled.

The upper, bent-back end is then located at the height of the sealing edge of the casing, so that the bent-back bracket 122 is in contact with the cover 17.

As has already been explained, the plate 62 of the electronic unit has several contact points which project into the plug casing 70. This has been depicted yet again, in cross-section, in Figure 7. The said figure depicts a section through the casing in the area of the plug casing 70 and the electronics mount 60, or of the swiveling area.

The plate 62, to which a power transistor 131, among other items, is soldered on, is positioned in the electronics mount 60. A cooling clamp 132 is connected with the power transistor 131. The transistor 131 and the cooling clamp 132 project through the penetrating aperture 76 in the base of the swiveling area 31, whereby the cooling clamp 132 is placed close to the cooling plate 120 in a surface manner. The outwardly-bent bracket 121 ensures that it is supported on the wall of the casing, since the cooling bracket 120 is placed close to the cooling clamp 132 in an areal manner. It is to be noted, in addition, that the bent-back end 122 is placed close to the cover 17. The cover 17 thereby serves for a cooling for the power transistor 131 over a large surface area.

As can also be noted in Figure 7, and has already been explained, the plate 62 has several connecting pins which project into the

plug casing 70. The contact pins 111, 117, 118 of the contact plate 22, which project into the accommodation area 60, are likewise connected with the plate 62 by means of corresponding conducting strips. One of these conducting strips connects the contact pin 118 to the primary conducting strip 101 with the ground connection pin in the plug casing 70. A contact spring 103 is not only thereby brought into connection with the ground, but also the brush which is contact with the contact plug 105. Moreover, the cover is connected with the ground by way of the cooling plate and the bent-back end 122. In addition, it is ensured that, during the formation of the brush support plates, the area which is placed in connection with the ground is brought into contact with the casing of the electrical motor, which is flange-mounted with the casing 3. All of the metallic parts are, insofar as they do not serve for the conducting of voltage, thereby brought into contact with the ground. The electrical motor can, as the result, easily be screened.

The second contact spring 116 is supplied with current by way of the second contact pin 117, while the second brush, which is in contact with the contact lug 107, is supplied with voltage by way of the throttle, by way of the first contact pin 111, through the third conducting strip 109, which is connected with the ground by way of the capacitor.

In this concept, the entire provision of power of the electrical motor, of the switch, which is formed by the contact springs 103, 116, as well as the conducting strips on the lower side of the worm wheel, as well as the electronic unit, are supplied with voltage by way of the contact plate, which voltage is supplied by way of a single plug unit. No additional wiring outside of the casing is necessary.

The following proposal is made for the attachment of the contact plate on the base of the casing (see, in addition, Figure 10).

Usually casing pegs 140 which correspond with corresponding holes in the plate, project out from the base of the casing. Insofar as the plate has been inserted, the peg projects out over the surface of the plate, so that it can now be pressed down with a heat stamp in a melting method, whereby a mushroom-shaped structure, which holds the plate in a secure manner, is brought about.

Since, as has already been explained, the plastic is interspersed with fibers, this method simply can not be used, since the fibers themselves do not take part in the deformation.

The hole 141 is thus formed in the plate in a conical manner, so that a relatively sharp edge 142 is brought about on the one side of the plate, while a broad opening is brought about on the other side. The diameter of the upper side of the opening -- thus, at that place where the sharp edge is formed -- is somewhat smaller than the diameter of the peg.

If the plate is now pressed onto the pegs 140, these project through holes, whereby the sharp edge 142 engages, in the manner of a barb, with the casing surface of the peg 140, so that the plate 22 can not be removed again. A durable connection of the plate 22 with the casing is thereby brought about.

In order to facilitate the alignment of the plate before the insertion, the upper ends 143 of the pegs are constructed in a conically proceeding manner.

One additional detailed solution is to be noted in Figure 1. The shaft 4 of the motor proceeds into an end peg 150, against which a flat insert part 151 of metal is placed. This insert part 151 is inserted into a corresponding groove in the base body 20.

Since the shaft is held under pre-stressing by means of a

corresponding device 152, frictional heat is brought about between the end peg 150 and the contact disk 151. Since the groove is open at the top, the contact disk 151, which is provided, if necessary, with a bent-back bracket, can come into contact with the cover 17. The cover 17 thereby serves for the dissipation of the frictional heat which is brought about. The contact disk 151 can, preferably, be configured in an oval shape, whereby the longitudinal side is inserted into the groove which is open at the top.

Attachment of the peg 26 in the base of the casing: In order to achieve a secure attachment, the peg 26 is first of all provided with one or more circular grooves. In addition, the peg is also extrusion-coated during the injection molding of the casing. In this way, the peg is securely held in the base of the casing.

As is depicted in Figure 2, the peg can be provided on the one end, in a manner symmetrical to the groove, with an additional groove at the other end, so that the orientation of the peg does not need to be taken into consideration during the loading of the injection molding machine.

Since the drive unit which has been described above is also to be used for a windshield wiping and washing apparatus, a water supply is provided by way of the drive shaft 11. This is represented in further detail in Figure 11. The drive shaft 11 is, for this purpose, constructed in a hollow manner. The feed line essentially consists of a brass tubelet 200, which is bent back at one end. This bent-back area is encircled by a holding part 201 of plastic, which is sprayed around the tubelet. The holding part 201 has, first of all, a guide part 202, which is inserted into the hollow shaft and which centers the tubelet 200.

The other end is constructed as a nozzle 203 onto which a tube can be slipped. The base body 204 is provided with undercuts, by means of which this can be inserted into an opening in the cover

17 in the manner of a bayonet unit. The other end of the tubelet 200 is provided with a sealing part 205 which serves, at the same time, as a carrier unit for a metallic nozzle 206. In addition, the sealing part 205 has a recess into which the nozzle 206, the external contour of which is spherical, can be pressed. The nozzle 206 can now be aligned with the sealing part 205, so that the washing water strikes the windshield within a defined area. The sealing part is itself provided with a central blind hole 207, which ends in the accommodating area of the nozzle and into which the nozzle boring 208 discharges.

The problem now consists of securely attaching the sealing part 205 to the tubelet 200 in such a manner that the position of the sealing part itself is not changed during an adjustment of the nozzle 206.

In addition, the sealing part 205 has a guide peg 209 which can be inserted into the metallic tubelet 200, whereby the external diameter of the peg 209 approximately corresponds to the internal diameter of the tubelet. The fit must not, in any event, be too narrow, so that the tubular peg 209 can be inserted into the tubelet without bending.

In order to achieve a torsional securing of the seal 205 to the tubelet, a ring-shaped stud 210, which is positioned coaxially to the tube-shaped peg 209, so that an annular groove arises between the stud 210 and the tube-shaped peg 209, the width of which groove corresponds to the thickness of the wall of the tube, is additionally provided. If the end of the tubelet is roughened or milled, or if the coarseness of the surface is slightly increased in any manner on its external side, then the tubelet is seated, with sufficient clamping force, in the annular groove between the stud 210 and the peg 209.

The axial length of the stud 210 is determined in such a manner

that a sufficient clamping force can be produced. The length of the tube-shaped peg 209 is determined in such a manner that a sufficient tightness of the support unit 205 relative to the tubelet is brought about.

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List of references

001	Electrical motor
002	Drive unit
003	Drive unit casing
004	Motor shaft
005	Helical unit
006	Worm wheel
007	Axle
008	First lever
009	Partial pinion
009'	Partial pinion
010	Second lever
011	Drive shaft
012	Center of rotation
013	Center of rotation
015	Cap
017	Cover unit
020	Base body
022	Contact plate
023	Electronic unit
026	Peg
027	Base
028	Depression
029	Screening throttle
029'	Capacitor
030	Groove
031	Swiveling range
032	Stage
040	Bearing sleeve
041	Mounting dome
042	Base
045	Reinforcement strut
050	Edge

051 Support surface
052 Lower edge area
053 Base
055 Base socket
054 Rib units
060 Reception chamber
061 Cover
062 Plate
070 Plug casing
071 Casing
072 Separating wall
073 Guide groove
074 Penetrating apertures
075 Penetrating apertures
076 Penetrating aperture
080 Attaching element
081 Attaching element
082 Attaching element
083 Side wall
084 Side wall
085 Surface
086 Attachment eyelets
090 Depression
091 Depression
092 Motor casing
092-A Brush support plate
093 Guide channels
094 Brush
095 Holding plate
096 Blade
097 Casing mantle
101 Primary conducting strip
102 Penetrating aperture

103	Contact spring
104	Contact
105	Contact lug
106	Conducting strip
107	Contact lug
108	Connecting part
109	Third conducting strip
110	Mount
111	Contact pin
112	Connection
113	Connection
115	Conducting strip
116	Contact blade
117-A	Contact
117-B	Contact pin
118	Contact pin
120	Cooling plate
121	Connecting part
122	Contact surface
123	Bracket
131	Power transistor
132	Cooling clamp
140	Casing peg
141	Hole
142	Edge
143	End
150	End peg
151	Insert part
152	Device
200	Brass tubelet
201	Holding part
202	Guide part
203	Nozzle
204	Base body

205 Sealing part
206 Metal nozzle
207 Blind hole
208 Nozzle boring
209 Guide peg
210 Stud

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PATENT CLAIMS

- 1) A casing for a drive unit, which consists of a base body with at least one depression for the accommodation of drive unit elements, characterized in that, in addition to the first recess (25), a second recess (60) is provided, the open side of which lies opposite to the open side of the first depression (25).
- 2) A casing in accordance with claim 1, characterized in that, penetrating apertures (75) are provided between the first recess (25) and the second recess (60).
- 3) A casing in accordance with claim 1 or 2, characterized in that, a plug casing (70) is connected, in a single part with the base body (20), to the second recess (60).
- 4) A casing in accordance with one of the preceding claims, characterized in that, a flange surface, to which an electrical motor can be attached, is provided, whereby the brushes (94) of the electrical motor are provided in or on the flange surface, and that, penetrating apertures which lead into the first recess (25) are provided in the flange surface.

- 5) A casing in accordance with claim 4, characterized in that, the drive unit and the electronic unit are provided in a casing (20), whereby the electrical motor is flange-mounted to the casing and the casing (20) is provided with a plug casing (70), whereby the electrical connections between the plug in the plug casing (70) of the electronics unit, the electrical motor, and a switch which is activated by the drive unit, are carried out by way of conducting strips which are placed exclusively in the casing.

ABSTRACT

CASING FOR A DRIVE UNIT

A casing for a drive unit is arranged in a common base body with an integrated electronic unit.

The base body includes two recesses, the openings of which lead to the opposite sides of the casing. In the first recess, drive elements are located; in the second recess, the electronic unit is inserted.

The electronic unit is connected to a flanged motor as well as to a parking position switch located in the drive unit via penetrating apertures in the casing so that no lines run on the external side of the casing.

(Figure 3)

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Fig. 1

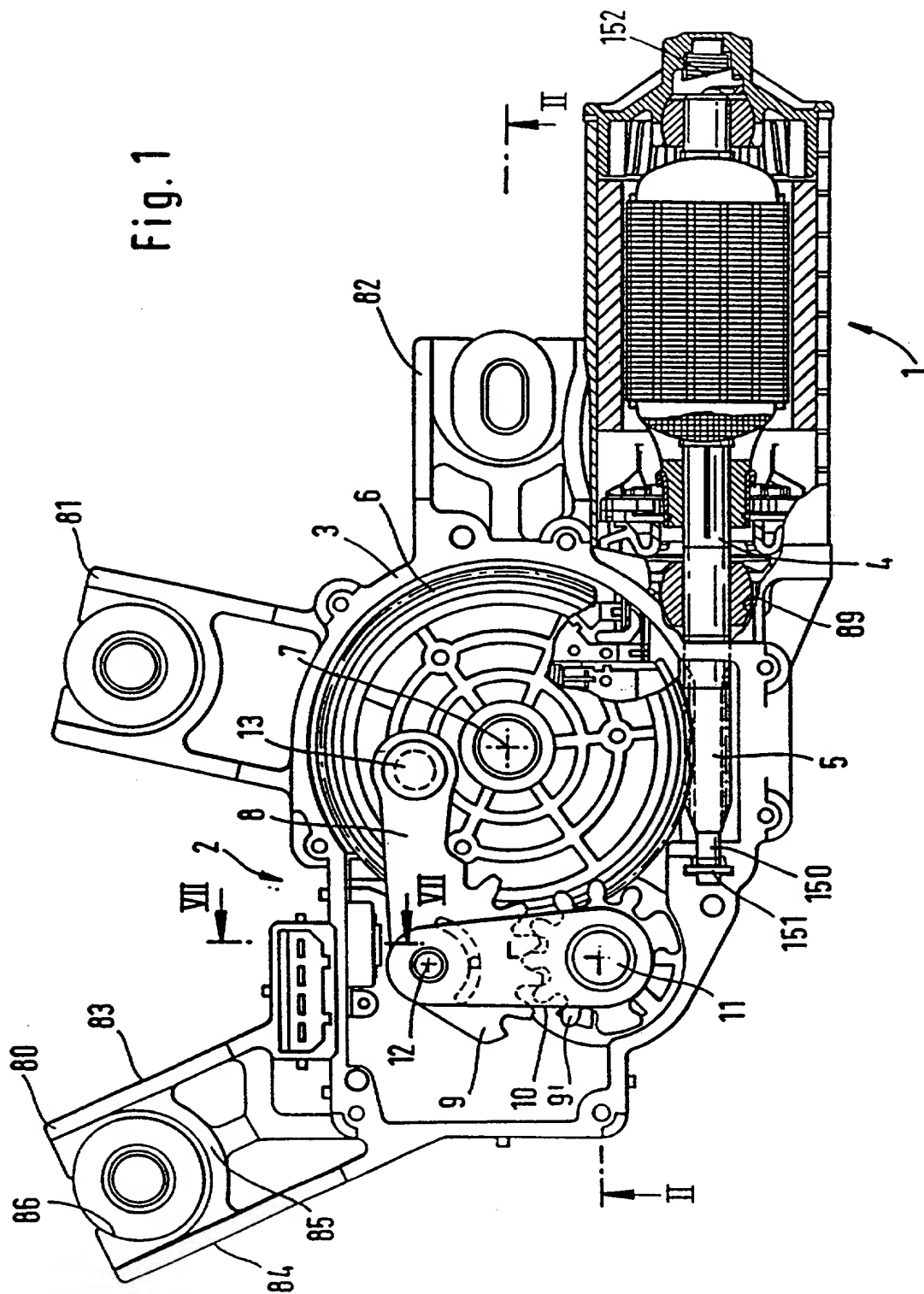




Fig. 2

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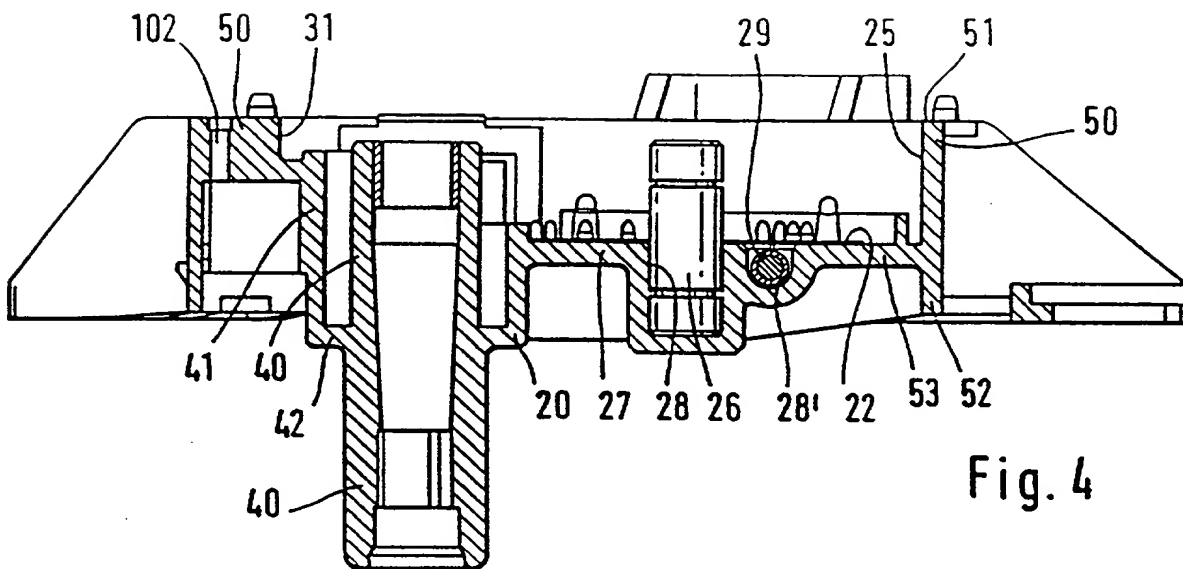


Fig. 4

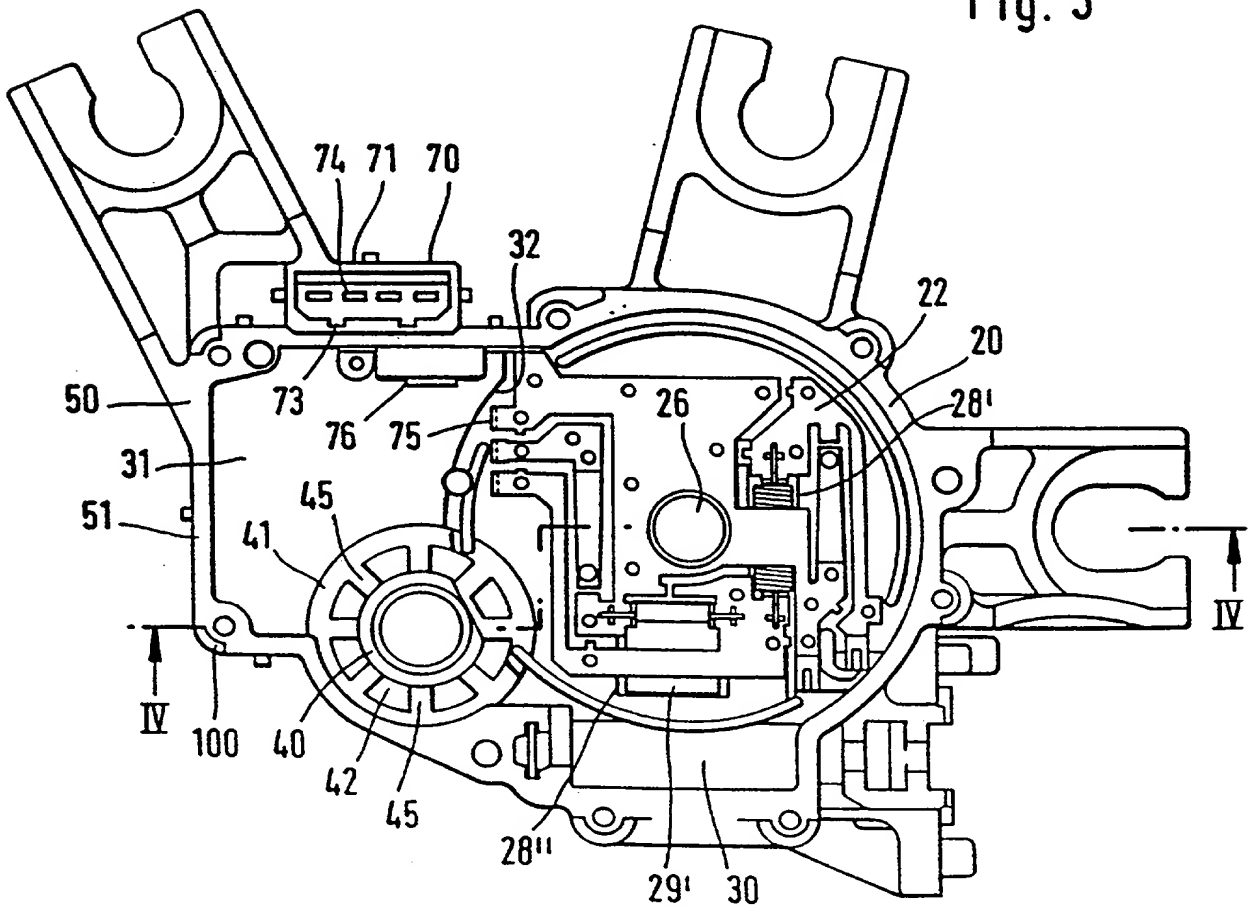
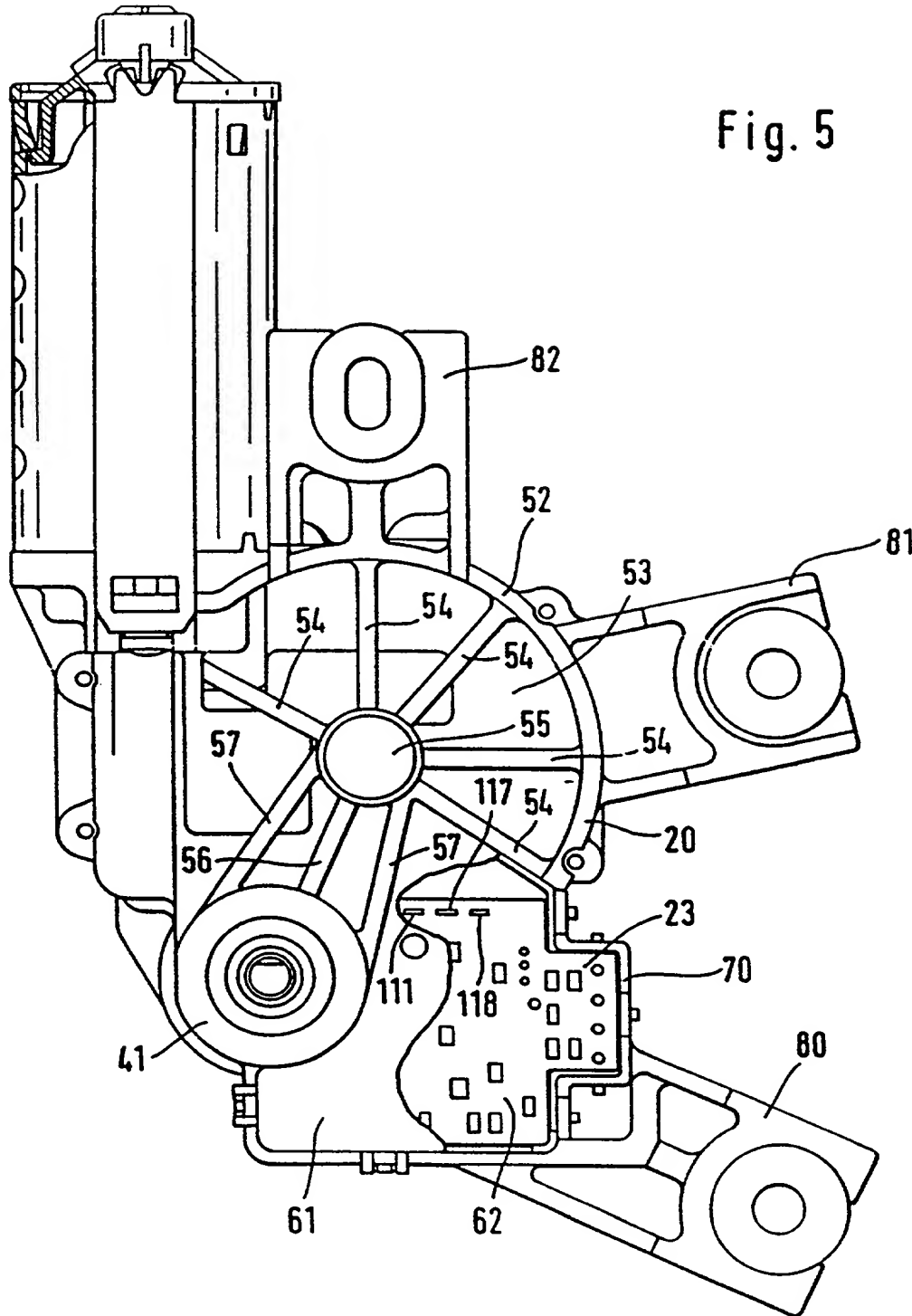


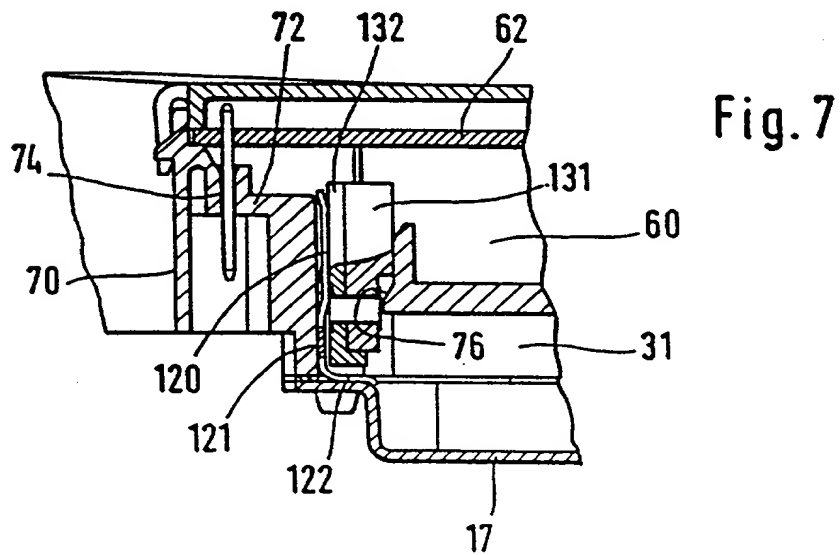
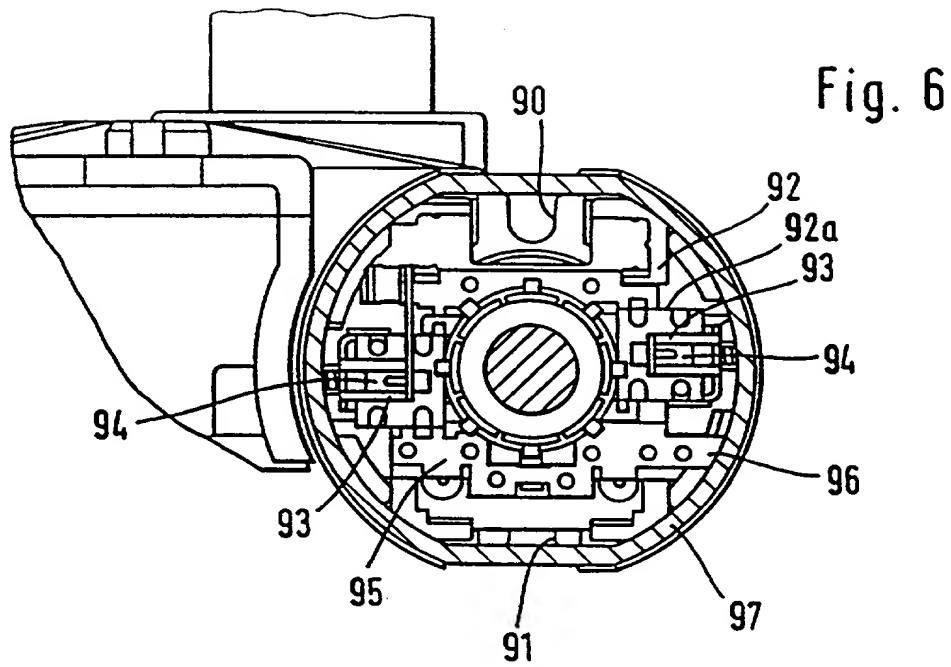
Fig. 3

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Fig. 5



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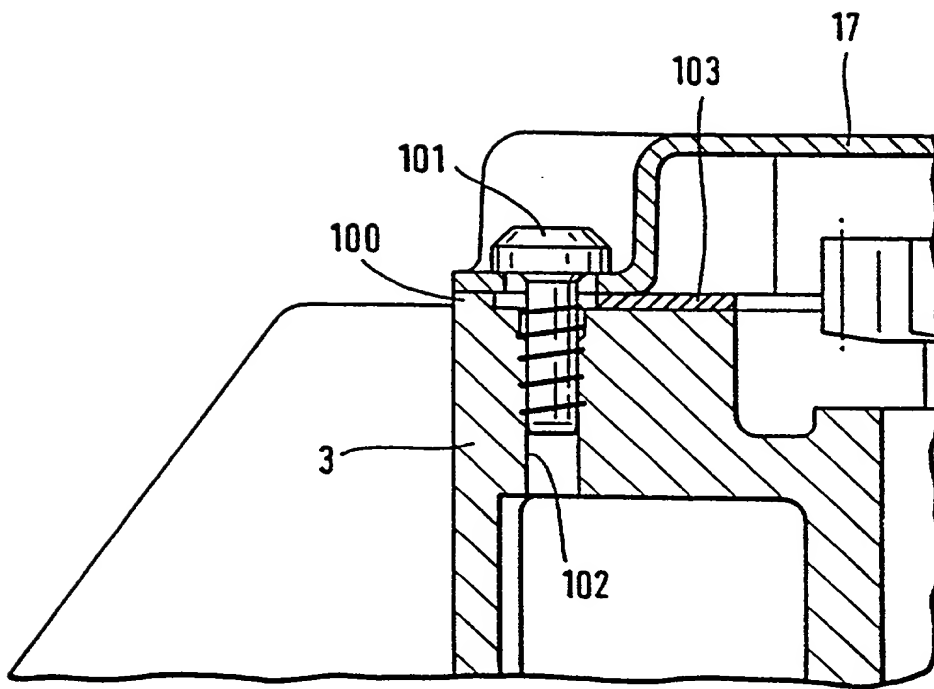


Fig. 8

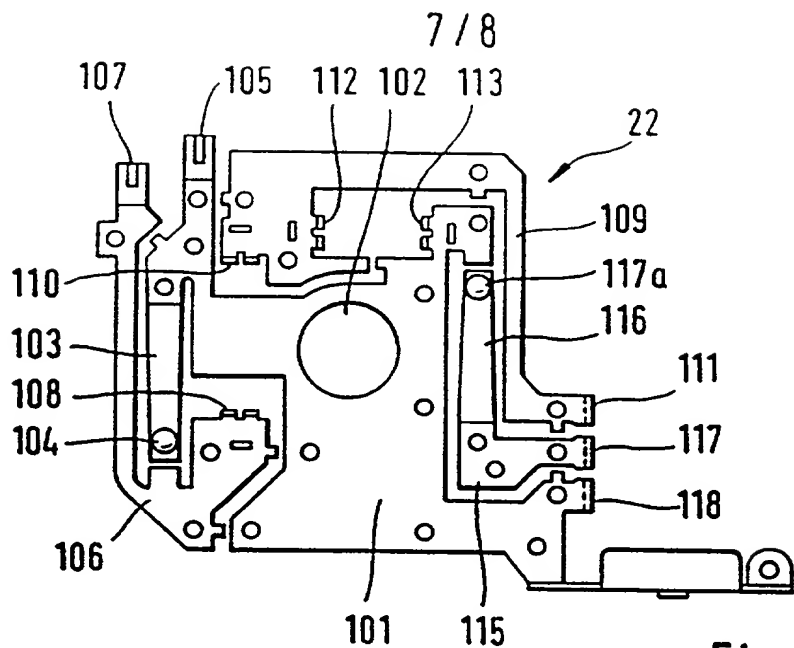


Fig. 9a

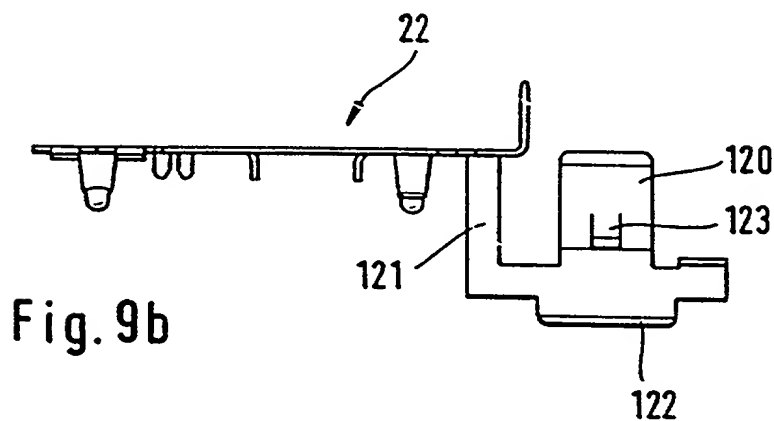


Fig. 9b

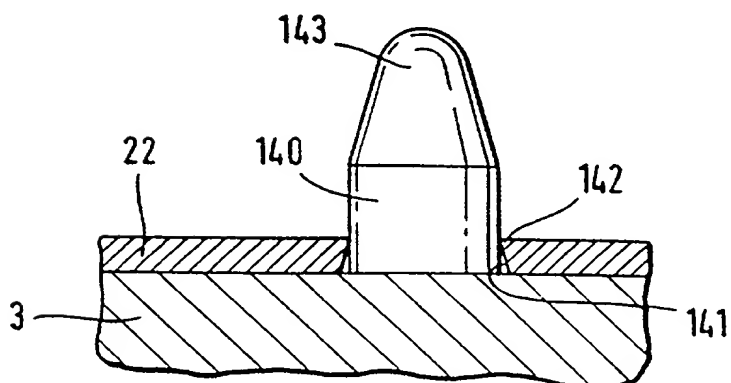
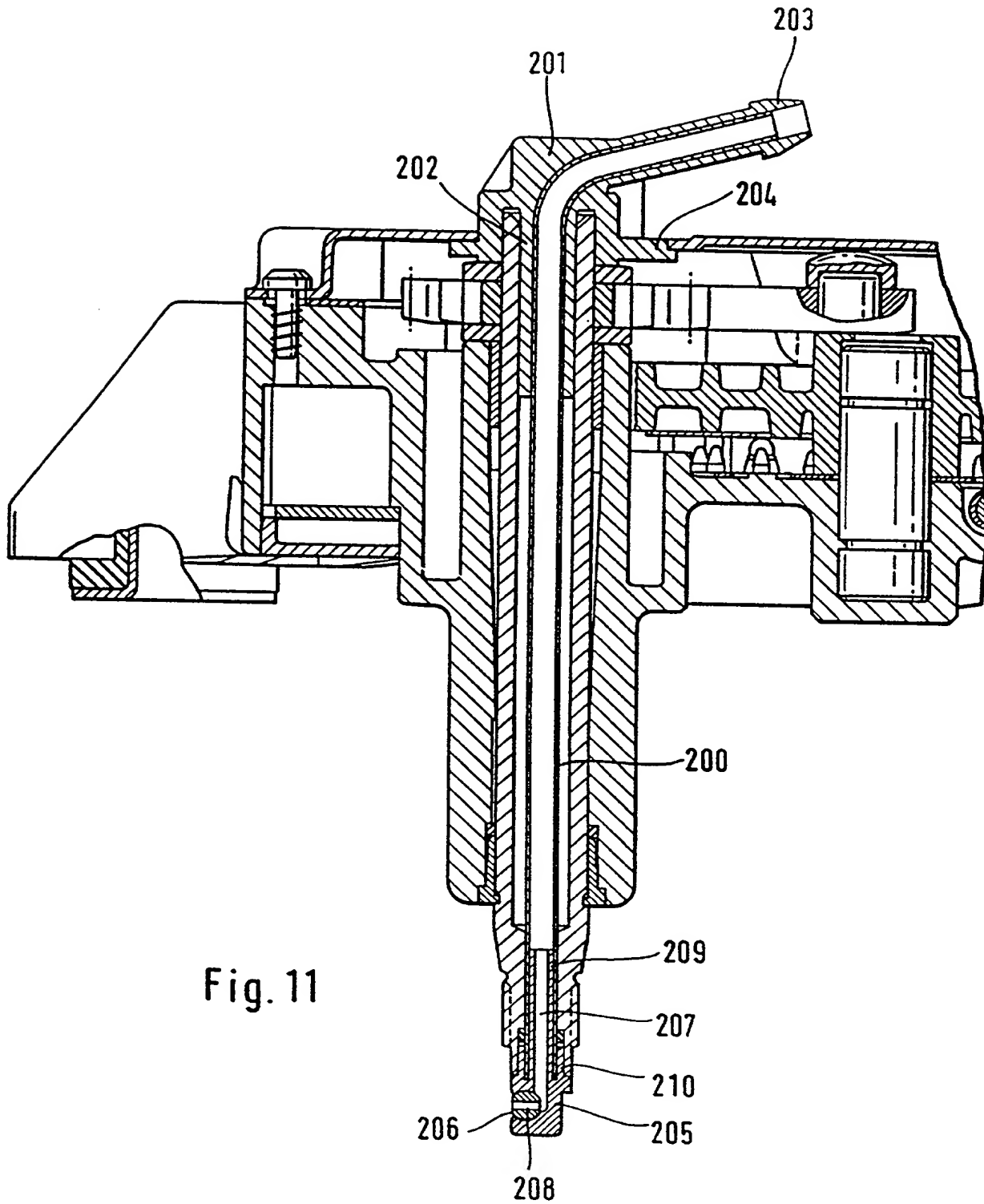


Fig. 10

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COMBINED DECLARATION AND POWER OF ATTORNEY
(Original Application - Joint Inventors - No Priority Claimed)

As the below named inventors, we hereby declare: that our residences, post office addresses and citizenships are as stated near our names below; that we are joint inventors and we believe we are the original and first inventors of the subject matter of which is claimed and for which a patent is sought on the invention entitled

CASING FOR A DRIVE UNIT

which is described and claimed in the attached specification and amended by an amendment thereto submitted therewith (if any); **Attorney docket AP 8563**; that we have reviewed and understand the contents of this specification, including the claims, as amended by any amendment referred to above; that we do not know and do not believe the same was ever known or used in the United States of America before our invention thereof or patented or described in any printed publication, in any country before our invention thereof for more than one year prior to this application, or in public use or on sale in the United States of America more than one year prior to this application; that the invention has not been patented or made the subject of an inventor's certificate issued before the date of this application in any country foreign to the United States of America on an application filed by us or our legal representatives or assigns more than twelve (12) months prior to this application; that we acknowledge our duty to disclose information of which we are aware which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, Section 1.56(a); and that no application for patent or inventor's certificate on this invention has been filed in any country foreign to the United States of America prior to this application by us or our legal representatives or assigns except as follows: NONE.

I hereby appoint Thomas N. Twomey, Registration No. 28,916; J. Gordon Lewis, Registration No. 28,735; Margaret A. Dobrowitsky, Registration No. 36,501; Joseph V. Coppola, Sr., Registration No. 33,373; Michael Stewart, Registration No. 36,018; and Kevin D. Rutherford, Registration No. 40,412, as our attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected herewith. Please address all correspondence and telephone calls to:

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We hereby declare that all statements made herein of our own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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